GRASS CARP: THE SCIENTIFIC AND POLICY ISSUES

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INTRODUCTION

I have been asked to discuss the scientific and policy issues involving the use of the grass carp for weed control. I find this somewhat difficult to address because it seems most of the issues raised in this country have been emotional issues. These issues have been based on the lack of understanding of a very complex problem which, as oftentimes presented, is very loosely tied to factual information.

INFORMATION IN THE PRESS

The grass carp has become a "popular" controversy in the United States receiving publicity in widely circulated national magazines and newspapers. We are, according to these articles, discussing a fish that can grow to a maximum size of anywhere from 25 - 400 lbs., consumes anywhere from 2 - 12 times its body weight per day, and has the ability to jump from 3 - 12 ft. out of the water. Sensationalism and publicity have blown the controversy way out of proportion.

Some of the popular articles opposing the fish have said, and I quote:

From Shreveport Times, Shreveport, La. - "The grass carp may very well constitute the most alarming situation in the history of fishery research."

From UPI wire service originating in Austin, Texas - "The grass carp could decimate the coastal rice industry if allowed to spread."

From the Galesburg-Register Mail, Galesburg, Ill. - "He feeds by smell rather than by sight, he roils the water and makes it muddy which creates serious diet problems for other fish."

From the Sentinel-Star, Orlando, Fla. - "The fishes effect on largemouth bass is devastating. It does not control noxious weeds."

From the River Hills Traveler, Missouri - "One of the first things discovered about it is that it prefers animal rather than vegetable food. It readily eats the eggs of game fish and rough fish. And finally, when it can't get enough animal matter, it turns to vegetable matter for food and even this is a problem."

By this time, everyone knows that "carp" and "Amur" are synonymous and that both are four letter words.

On the other hand, many of the fish's backers have had no less effect on the controversy. The label "SUPERFISH" certainly added fuel to the fire. Some of the popular articles supporting the fish have said, and I quote:

From Mechanix Illustrated - "As wily a game fish as the trout, as scrappy when hooked as the mighty tarpon, as tasty when cooked as the red snapper. It also has the potential to surpass beef as a source of protein."

From the Star Progress, Berryville, Ark. - "There is no possibility they will reproduce naturally in the U.S. They can easily be caught on hooks baited with grass or moss."

To me the worst of all are those that purport to only present the facts of the controversy so that you as an intelligent individual can decide for yourself. Again, I quote:

From AP wire service originating from Elkhart, Ind. - describes the grass carp as "A large off-white goldfish that grows up to two feet in length."

From the Anniston-Star, Anniston, Ala. - "In Arkansas where the fish is grown on a large scale, those handling it always wear a baseball catchers mask for protection. One death has been attributed to the fish there."

From the Sunday Magazine of the Cleveland Plain Dealer - "At Arkansas hatcheries, employees always wear baseball or fencing masks when working with the fish."

From the River Hills Traveler, Missouri - "The original importation of these fish was by the Soil Conservation Service in Florida."

And there is finally the supreme example of misinformation about these fish. An article in the nationally publicized American Legion Magazine began with a lead that read, "Through the years a monster has been invading our lakes, ponds, and streams - it's the grass carp - a fish introduced into this country from Germany in 1872." The article was complete with a very clear picture of the common or European carp.

SCIENTIFIC ISSUES

The scientific community hasn't been much different than the press in this matter. There appeared to be two factions here from the beginning. Those that support the "Innocent until proven guilty" theory who generally support the use of the fish, and those of the "Guilty until proven innocent" opinion who are generally against its use. Seemingly endless scientific studies of the grass carp can be quoted and the findings interpreted as good or bad, in most cases, depending on your point of view at the outset. If it does nothing else, the grass carp has stimulated the economy in this country by creating more jobs in fishery research in the last 10 - 15 years than anything else.

The fact is, the overriding questions about the effect of the grass carp remain unanswered. (1) Will the grass carp reproduce in this country? and (2) What will be its impact on the habitat? (usually concerned with speeding up the eutrophication process). These questions do not lend themselves to

the cold objectivity of the classical scientific method. We cannot predict future weather patterns or the subtle effects of high water in high water years or the 100-year flood might have on the reproductive habits of these fish. Certainly not from laboratory or pond experiments. Nor can we predict their impact with complete certainty on any pond, lake or reservoir. There are so many intricate variables within any isolated aquatic system that they are difficult to enumerate much less control and predict. Couple this with the many types of aquatic environments and complicate it further by adding in geographic location and the task becomes enormous. Yet this 100% certainty is what many seem to advocate before using the fish.

COMPREHENSIVE STUDIES

Now, and hopefully without too much bias, I will briefly discuss what I consider to be the most comprehensive study of the grass carp in the United States to date. That is the use of the grass carp in Arkansas. The objective of the Fisheries Division of the Arkansas Game and Fish Commission is to produce the optimum sustained harvest and utilization of the states fisheries resources for the fishing public. Grass carp are important to the utilization of the resource by removing choking aquatic vegetation and allowing fishermen access. We found that the use of the grass carp to allow access is not mutually exclusive of managing the fish population for optimum sustained harvest by the fishing public.

To the present date, more than 100 lakes in Arkansas totaling over 50,000 acres have been stocked with grass carp for aquatic vegetation control. We feel that we have no major vegetation problems in Arkansas and those that were the worst are under control and manageable. We also have some of the best and most diversified fishing in the country.

In the late 1960's, Arkansas' experience with the grass carp began on the Joe Hogan State Fish Hatchery at Lonoke, Arkansas. Successful artificial spawning methods were developed over the first few years and the fish were tried for vegetation control in hatchery ponds with excellent success. This is not to say there were not some minor problems, primarily in handling the fish in the seine during harvest, but these are of little consequence when compared to attempting to harvest a fingerling or production pond choked with vegetation. Stocking rates in hatchery ponds may range from as low as 10 fish per acre to an excess of 1000 fish per acre depending upon the severity of the problem and the length of time available to achieve control. Our stocking rates are also aimed at producing an 8 - 10" stocker size fish by the time the vegetation in the pond is controlled, then the fish are used for vegetation control in state managed lakes.

After such success in hatchery ponds, some very major problems in the states fishing waters were the next objective. Obviously a lake is not like a hatchery pond and in 1968-69, the first lake in Arkansas was stocked with the grass carp. This was a topographically isolated, shallow, man-made lake. Vegetation control was achieved and other isolated lakes were stocked with the same results. No detrimental effects on the fish populations in the lakes could be determined from routine sampling. Fisherman success in these lakes remained the same or better, likely due to a better access to all areas of the lake. By 1972-73 the grass carp had become a routine management tool for

the control of aquatic vegetation in Arkansas' lakes and has continued to be since that time.

We have never proposed the grass carp as a sport or game fish in Arkansas, however, it is remarkably good eating. After the fish have reached a suitable size and vegetation is controlled, some lakes have been opened to special commercial fishing seasons for removal. This has met with varied amounts of success with the grass carp specifically as the target species. On a statewide basis, in 1976 over 50,000 lbs. of grass carp were taken by commercial fishermen in Arkansas and entered the fresh fish markets in the state. The grass carp remains less than 1% by weight of the total commercial catch of an estimated 6.5 million lbs. in Arkansas during 1976.

During routine population sampling, our district fishery biologists began to notice that, in waters where they were present, grass carp surfaced very soon after rotenone was applied. Further tests in the laboratory and small ponds showed that the grass carp was susceptible to rotenone at approximately the same level as the gizzard shad. This is approximately 1/10 the amount necessary to kill most fish; therefore, the grass carp could be selectively removed from existing fish populations. Even though we have never specifically targeted a kill toward removing grass carp, their sensitivity to rotenone causes many to be seen during sectional fish kills and other renovation projects. In Arkansas the fish management kills are scheduled on Saturdays and the public is invited to pick up and utilize the fish. Needless to say we have excellent public participation and many people have become aware of the table quality of the grass carp. It has often become the trophy fish of the fish kill in those waters where it is found.

In 1976, a survey of 31 lakes totaling more than 16,000 acres (Bailey, In Press) was made utilizing population sample data taken both before and after grass carp were stocked. Some of the parameters looked at were total standing crop, catchable bass and crappie, total standing crop of shad, young of the year of bass and bluegill, and condition factor of catchable bass, bream, and crappie. A look at the overall fish population showed a declining trend in 6 of the lakes, an upward trend in 8 of the lakes, and the remainder fluctuated within limits measured prior to the introduction of grass carp. The only logical conclusion being that the grass carp eliminate the vegetation but other factors such as water level, fertility, and weather have a greater effect on fish populations than does the presence of the grass carp.

The only thing widely agreed upon about the grass carp is that they do eat aquatic vegetation. Our experience has been that weed removal by the grass carp produces no noticeable effect other than what would be experienced from weed removal by any other method. We also believe that a tool that can be used for vegetation control with less environmental impact and expense than chemical and other known methods and be recovered as a part of our fishery resource is a valuable asset to our program.

Granted, there is much we do not know about the fish that we could learn, but where does it end. We can spend years constructing the most complete model possible that should predict with 99.9% accuracy. But in the end it always seems that the model becomes the end instead of the means and the final

step is to stock the fish and see if the model is right. The philosopher ponders the truth, the scientist searches for the truth, but the truth is what happens. The only perfect science known to man is hindsight.

POLICY ISSUES

It seems to me that the issue at hand is to decide if the possible or known values of the fish outweigh the possible or known detrimental effects of the fish and that decision is still further complicated and influenced by the primary use of the water involved. We have been primarily concerned with sportfishing, fish production, and irrigation or drainage; but what about boating and other water related recreational activities, aesthetic qualities, power production, and a multitude of industrial uses. Whatever your perspective toward water use, one overriding problem that spans all uses is nuisance aquatic vegetation and a satisfactory method of controlling it is essential. There are no easy answers.

The one thing I have seen from my experience with Arkansas and our distribution of the fish to various agencies, institutions, and organizations for research purposes is that almost without fail, those who have had experience with the fish in actual field trials have opinions ranging from advocacy to a 'proceed with caution' approach. But none that I am aware of are among those still adamantly opposed to their use.

After nearly 15 years in this country and reams of research reports, every new paper and article still is filled with 'may' and 'might' and every conclusion points out other questions that remain unanswered. There is a saying that goes: The best thing you can do is the right thing, the second best thing you can do is the wrong thing, and the worst thing you can do is nothing. However you see the issues involved, the grass carp controversy goes on and will not be resolved by those who choose to sit back and espouse their opinions and beliefs without some real efforts to substantiate them.